REMARKS/ARGUMENTS

This amendment is in response to the Office Action mailed May 11, 2006. The responses below are in the order in which the rejections are set forth in the Office Action.

Claims 1-20 are pending in the present application. Claims 1-11, 13, 14, and 17-19 are rejected. Claims 1 and 17 have been changed, and claim 20 has been added by this amendment.

The Examiner rejected claims 1-10 and 17-19 under 35 USC 103(a) as being unpatentable over Smith (U.S. Patent No. 6,349,097). Applicant respectfully traverses, and has amended claims 1 and 17 to clarify the invention.

Smith discloses a system including receive queues corresponding to possible destinations for a packet. If the packet is a multicast packet, an entry is made in each receive queue corresponding to the destinations for the packet, where a packet's destinations are found using a look-up routing table. For each entry read in the receive queue, a corresponding data packet is read from memory and output.

In contrast, Applicant recites in claim 1 a data transmission system including a packet switch module and a memory block located at each crosspoint, the memory block including memory control means for determining from the header of a received data packet whether the packet is to be forwarded to the output port associated with the crosspoint. The memory control means analyzes all the bytes following the header when the header indicates that the packet is a multicast address packet preceding a multicast frame. All the bytes following the header are analyzed in order to determine,

without the use of a routing table, whether the multicast frame packets are to be forwarded to the output port associated with the crosspoint.

Smith does not disclose or suggest memory control means which analyzes all the bytes in a packet following a header when the packet is a multicast address packet preceding a multicast frame, where the bytes are analyzed in order to determine (without the use of a routing table) whether the multicast frame packets are to be forwarded to the output port associated with the crosspoint. Smith, in contrast, uses a multicast routing table, which is his "look-up table" disclosed at col. 8, lines 42-47 and col. 17, lines 2-6, to determine the identity of destination ports (col. 10, lines 48-50) for a packet. Smith must use the address in a received cell header to find (in the look up table) the address of the destination port. Smith does not have the memory control means of each crosspoint in a switch module analyze the bytes following a header in a received multicast address packet to determine whether the frame packets following the address packet are to be forwarded to the output port associated with that particular crosspoint in the switch module. Smith discloses no multicast address packet; each cell carries its own destination information (col. 8, lines 47-50) and the routing table is used to find the destination. Applicant's multicast address packet, in contrast, allows a memory control means to analyze the bytes in a specific address packet to determine if that memory control's output port is a destination for the following multicast frame packets, and thus the memory control at each crosspoint knows whether the frame packets will be submitted to the output port for that crosspoint, without having to consult a routing table. Thus, for example, the maintenance of such routing tables can be avoided when using Applicant's invention.

The Examiner states that Smith discloses at Fig. 2 and col. 15-16, lines 48-54, that a memory control means analyzes the information when the header indicates the packet is a multicast address packet preceding a multicast frame, in order to forward the multicast frame to the output port. However, Fig. 2 shows that Smith uses a look-up table 144a as a routing table, as explained above, to find the destinations for cells. The cited lines at col. 15-16 describe Smith's process of reading multicast descriptors from receive queues, a descriptor having multicast processed bits (MPBs) provided before the multicast cell. However, these processed bits are not multicast address packets as recited by Applicant. Smith's multicast descriptor is created by Smith's data unit after a multicast cell is received by a memory control in unit 12, by setting each MPB as one of the destinations for the cell, each of these destinations found via the multicast routing table 144 as explained above (col. 10, lines 48-50, 63-67). There is no multicast address packet received by Smith's data unit 12 which can be analyzed to determine if a crosspoint's output port is a destination for a multicast frame--Smith's device must create the MPB address information using the routing table. Furthermore, Smith's memory control does not receive a multicast address packet, but rather provides a header for each cell (bits MPB0 to MPB63 in Fig. 5). Thus the Examiner's cited Figure and description do not disclose or suggest Applicant's invention.

The Examiner states that Smith does not clearly teach analyzing all the bytes following the header, but that Smith teaches analyzing all the remaining bytes of the cell, which is the payload, in order to know the destination information, at col. 19-20, lines 43-26; and therefore it would have been obvious to analyze all the bytes because Smith teaches information data storage in the input buffer and analyzes the routing destination according to the information.

However, these cited lines of Smith describe a switching unit that receives each cell with a routing tag attached to it, the routing tag specifying the cell's destination; the routing tag is converted to a port address to allow output from the input port to the destination. There is no multicast address packet received here in advance of a multicast frame; rather, each cell has its own destination tag byte that is first received, and is attached to the cell data bytes (col. 19, lines 55-60). Furthermore, Smith's switching unit 8 does not analyze all the bytes of the payload after the header to determine whether the packets of the frame are to be forwarded to the output port associated with a crosspoint, as recited by Applicant. Smith's switching unit 8 only examines the routing tag (col. 20, lines 3-6); the data byte payload is simply stored in a buffer (col. 19, lines 58-60) and transferred to an output port (col. 20, lines 55-62). Smith's storing of the data in an input buffer and transferring the data to the output is not an analysis of all the bytes of a packet. Furthermore, Applicant's invention does not analyze the data payload of a packet, but rather analyzes all the bytes of a multicast address packet provided in advance of (preceding) the payloads in a multicast frame. Applicant provides a an address packet having address information for a following frame, which is not a tag attached to each data cell as in Smith. Therefore it would not be obvious in view of Smith to analyze all the bytes following a header of a multicast address packet as recited by Applicant.

In view of the foregoing, Applicant believes that claim 1 is patentable over Smith.

Claims 2-10 are dependent on claim 1 and are patentable over Smith for at least the same reasons as claim 1 and for additional reasons. For example, claim 3 recites a header validation control block and memory controller used with the multicast address packet of the present invention, and is not disclosed or suggested by Smith. Claim 7 recites that each byte of the multicast address

packet following the header is associated with a switch module and defines the addresses of the output ports of the module, to which the multicast frame is to be forwarded. Smith neither discloses nor suggests any such multicast address packet, as explained above with reference to claim 1.

Claim 17 recites a data transmission system including a switch module having at least two crosspoints, a memory operatively coupled to each one of the at least two crosspoints, and a plurality of memory controllers, one of each operatively coupled to each one of the memory. The memory controllers examine a header of a packet which is forwarded to output ports associated with the coupled crosspoint and analyze all the bytes following said header when the header includes a specific configuration indicating that said packet is a multicast address packet preceding a multicast frame. The multicast address packet includes information describing a plurality of destination output ports for said multicast frame. All bytes following the header are analyzed in order to determine, without the use of a routing table, whether the packets of said multicast frame are to be forwarded to said output port associated with the coupled crosspoint.

Similarly as explained above with reference to claim 1, Smith does not disclose or suggest memory controllers that analyze all the bytes in a packet following a header when the packet is a multicast address packet preceding a multicast frame, where the bytes are analyzed in order to determine whether the following multicast frame packets are to be forwarded to the output port associated with the crosspoint. Applicant therefore believes claim 17 is patentable over Smith. Claims 18 and 19 are dependent on claim 17 and are patentable over Smith for at least the same reasons as claim 17.

Applicant therefore respectfully requests that the rejection of claims 1-10 and 17-19 under 35 U.S.C. 103(a) be withdrawn.

The Examiner rejected claims 11, 13 and 14 under 35 U.S.C. 103(a) as being unpatentable over Smith (U.S. Patent 6,349,097) in view of Loewen et al. (U.S. Patent 6,798,744). Applicant respectfully traverses. Claims 11, 13 and 14 are dependent from claim 1. Neither Smith nor Loewen et al. disclose or suggest memory controllers that analyze all the bytes in a packet following a header when the packet is a multicast address packet preceding a multicast frame, where the bytes are analyzed in order to determine whether the following multicast frame packets are to be forwarded to the output port associated with the crosspoint, as recited in claim 1. Applicant therefore believes claims 11, 13, and 14 are patentable over Smith in view of Loewen for at least the same reasons as claim 1, and respectfully requests that the rejection of claims 11, 13, and 14 under 35 U.S.C. 103(a) be withdrawn.

New claim 20 recites the subject matter of claims 1, 2, 11 and 12, which the Examiner indicated to be allowable. Claim 20 is therefore believed to be patentable.

It is believed the present amendment answers all the issues raised by the Examiner. Reconsideration is hereby requested and an early allowance of all the claims is solicited. Should any unresolved issues remain, Examiner is invited to call Applicants' attorney at the telephone number indicated below.

Respectfully submitted,

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Date

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